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**NOTES ON AN AQUATIC INSECT, OR INSECT-LARVA, HAVING
JOINTED DORSAL APPENDAGES.**

BY ADELE M. FIELDE.

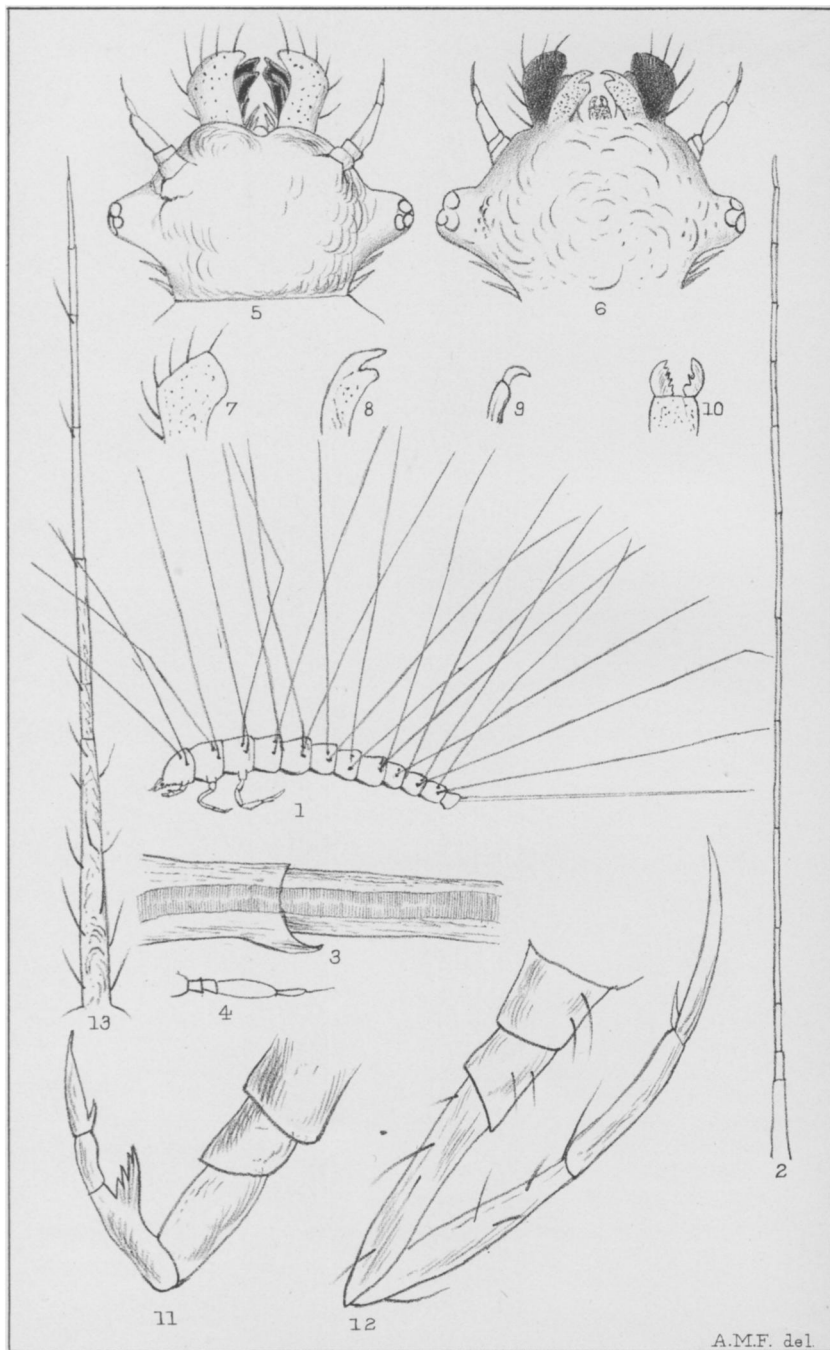
I have found here (at Swatow, China) in May and June, the temperature of the air being about 80° F., in still pools of fresh, living water, an insect or insect larva, having upon its back four longitudinal rows of jointed appendages, of nearly the same length as the body of the insect, and capable of being raised, lowered or bent, either by the insect or by external pressure. During this year and last year, I have found over a hundred specimens, varying from $\frac{1}{8}$ to $\frac{3}{8}$ of an inch in length. *Rotifera*, *Vorticella* and *Oscillatoria* with shreds of vegetable fibre, were attached upon and among the appendages. The color varies with the habitat, from pale green to black. As it slowly crawls upon water-plants, it resembles a minute porcupine; but it is discerned with difficulty, because of its similarity to its vegetable environment. I have caught my specimens in only one way—by taking from the pool, in which I hoped to find them, a quantity of the water and algæ, and keeping these in a basin till the staleness drove the insects to the sides of the vessel, where they escaped the sinking, decaying raft in which they had been concealed. Several of the larger specimens found have been kept alive for more than a month, in a soup plate in which the water was daily changed. They appeared to feed on microscopic objects, probably the heliozoans, rotifers and infusorians, which swarmed on the plate. They neither grew nor moulted within the month, and finally died, oppressed and perhaps suffocated by the diatoms that stood out like branches from all their appendages, making them look like moss. That these creatures moult in growing is proven by the exuviae of varying size, found in the waters they naturally inhabit.

The head is flat, with a pair of large eyes, made up of clusters of six ocelli, projecting from the sides. The antennæ are short, six jointed, and just in front of the eyes. The biting mouth-parts are strong and horny. The three thoracic segments bear three pairs of six-jointed legs, ending in a long claw. All are used deftly in clearing the back from parasites. The second pair is double the length of the first pair, and the third pair a little longer than the second. The abdomen has nine segments, with the prominent vent on the ventral side of the posterior segments, which bears two sharp

jointed styles, nearly as long as the body. The number of joints in the anal styles vary from 7 in an individual $\frac{1}{8}$ of an inch long to 11 in an individual $\frac{1}{4}$ of an inch long. The general shape of the body is cylindrical, tapering posteriorly, with the ventral surface flattened. All the segments, except the last, bear, on the dorsal half, four tapering, jointed tubes, containing branches of the trachea. The number of joints in each of these appendages vary from 12 to 17 in a specimen $\frac{1}{4}$ of an inch in length. In a specimen $\frac{1}{8}$ of an inch long there were 7 joints in each dorsal appendage. The main tracheal trunks run one on each side, between the proximal ends of the two rows of appendages, through which they send long, straight branches.

PLATE VIII.

- Fig. 1. The insect, or larva; actual length $\frac{1}{4}$ inch; anal style and dorsal appendages about $\frac{1}{4}$ inch; first pair of legs $\frac{7}{80}$ inch; second pair $\frac{14}{80}$ inch; third pair; $\frac{16}{80}$ inch.
- " 2. Jointed dorsal appendage, showing the relative length of the joints; actual length $\frac{42}{80}$ inch; width of basal joint $\frac{3}{80}$ inch; number of joints, fourteen.
- " 3. A joint highly magnified, showing the tracheal tube which runs to the distal extremity of the appendage.
- " 4. Antenna, six jointed; total length $\frac{1}{80}$ inch.
- " 5. Dorsal aspect of head; actual width $\frac{6}{80}$ inch.
- " 6. Ventral aspect of head; actual length $\frac{5}{80}$ inch.
- " 7. 8. 9. 10. Oral appendages, magnified.
- " 11. One of the first pair of legs, actual length $\frac{7}{80}$ inch.
- " 12. One of the second pair of legs: actual length $\frac{14}{80}$ inch.
- " 13. Anal style, actual length $\frac{35}{80}$ inch, on specimen $\frac{3}{16}$ of an inch long.



A.M.Fielde on Aquatic Larva.